Effect of induced fruit ripening agent calcium carbide on some physiological aspects of gold fish Carassius auratus.

Synopsis of work to be done by

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Effect of induced fruit ripening

Agent, calcium carbide, on some physiological aspects of gold fish, Carassius auratus.

Fruits are the best natural foods usually consumed by human beings. Ripening is the final stage of maturation process. When fruit changes colour, soften and develops the flavor, texture and aroma that constitutes optimum eating quality.

Nowadays, fruits are artificially ripened by chemicals causing serious health hazards.

These prematuring treatments, are mostly followed for pre – maturally ripened fruits intended for better consumer acceptance and facilitating better marketing. Rise in population, causing increased demand of vegetables and fruits has led to the concept of artificial ripening. The fruits are harvested earlier and treated with artificial ripeners, But the drawback is that in such fruits and vegetables, required nutrients as well as natural test are affected.

The unsaturated hydrocarbons such as propylene, acetylene, ethylene etc. may promote ripening and cause or produce colour changes effectively. The cosmetic value of such artificially ripened fruits is found to improve, but organoleptic quality or value is damaged especially when harvested fruits aretreated without considering their maturity status. Besides, the quantity of ripening agents used to induce ripening for better cosmetic quality including appearance will be much more than that is required.

The commonly used fruit ripening agents are calcium carbide, acetylene, ethylene glycol, propylene etc. (Asif, 2012).

Ethylene glycol, an artificial fruit ripening agent, is colourless, and odorless liquid. Because of its sweet taste, it attracts the animal, ethylene glycol is released in the environment on large scale, leading to contamination of ground water.

Ethylene glycol causes ill effects on animals, human health as well as invertebrates.

"Calcium carbide" (C_a C_2) treatment hastens the ripening process of unripe fruits as shown by the rates of softening, respiration, flavor and colour change. But has hazardous effects on fruits and animals since it makes healthy fruits poisonous.

Effects of the fruits on humenhealth :-

Fruits and vegetables are unavoidable part of our nutrition, and play vital role as supplying necessary growth regulating factors essential for maintaining normal health.

Consumption of artificially ripened fruits and vegetables, causes serious effects on health including cancer, gastric irritation and mouth ulcer. Calcium carbide is a dangerous and corrosive chemical. Carbide ripened fruits cause several harmful effects to human health. As it possess traces of arsenic or phosphorous, causing vomiting, diarrhea with blood or without blood, burning sensation of chest and abdomen, thirst, weakness, difficulty in swallowing, irritation or burning of eyes and skin, permanent eye damage, ulcer on the skin, sore throat, cough and shortness of breath.

Consumption of fruits ripened with calcium carbide causes stomach upset. It affects the neurological systems, headache, dizziness, mood disturbance, giddiness, mental confusion, memory loss, cerebral oedema etc. This study is aimed at observing the hazardous effects of Calcium carbide on gold fish Carassiusauratus. Effects of artificial ripening agents on human are studied but are limited relating to aquatic animals. These chemicals reach the water body in various ways and make it unfit for survival of aquatic fauna. The gold fish is a familiar type of ornamental fish.

Main aspects of study would include

a) Mortality and behavior.
b) Changes in biochemical composition of vital tissues.
c) Changes in rate of O_2 consumption.
d) Changes in biomarker enzymes.

Adult fish of a particular size & weight range would be maintained in the lab condition for acclimatization. During this period they will be fed with fish diet. For mortality studies various groups will be made, each containing 10 fishes. One group is to be maintained as control. The experimental groups will be exposed to various concentrations of Calcium carbide. After every 24 hours mortality will be observed. The concentration which brings about 50% mortality in 24 hrs, will be treated as LC 50 / 24 hrs. During mortality study, changes in behavioral pattern will also be noted.

After determination of LC 50 / 24 hrs, three sub – lethal concentrations will be prepared to which fish will be exposed for short term and long term studies. After every exposure – period the fish will

be sacrified. The organs like liver, muscles, kidney, pancreas and blood will be utilized for observing changes in biochemical composition and enzymatic activities.

Similarly effects on ionic regulations will also be studied. An observation on changes in histology or organs like liver, kidney, pancreas, stomach, intestine, testis and ovary will be made.

Year wise plan of work

Plan of IstYear

1) Reference work.
2) Collection and identification of Cockroaches.
3) Determination of LC 50 for a specified duration.
4) Studies on behavioral changes and change oxygen consumption of whole body, for short term and long term exposer.
5) Studies on ionic regulation.

Plan of IIndYear

1) Changes in biochemical architecture of selected tissues.
2) Studies on biomarker enzyme activities.

Plan of IIIrdYear

1) Studies on haematalogical parameters.
2) Studies on histology of vital organs.
3) Analysis of data collected and interpretation.
4) Submission of thesis.